CAPACITY-BUILDING INITIATIVES FOR A DISASTER-READY SCHOOL COMMUNITY: DEVELOPMENT OF A COMPREHENSIVE DISASTER RISK REDUCTION MANAGEMENT PLAN

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Abstract

Considering the importance of the safety of learners and school personnel and the need for intensive planning and implementation of School Disaster Risk Reduction Management (SDRRM), this study attempts to identify the school's potential hazards and the disaster awareness, preparedness and involvement in capacity-building initiatives of the school community in General Emilio Aguinaldo National High School, a densely-populated school with 9,788 students. In order to attain the objectives of the study, a mixed-methods research design was employed, with the students, teachers, non-teaching personnel and administrators as respondents. From the assessment of the hazard, the school is at risk of both natural and human-induced hazards. The location of the school has low to high susceptibility to flood and high susceptibility to earthquake, with low susceptibility to liquefaction. In terms of building capacity in the community, the study reveals that the members of the school community have utmost awareness on disasters but have limited belief in the preparedness of the school and participation in capability-building initiatives of the SDRRM. Therefore, communicating risk information and safeguarding trust on community preparedness remain challenges. To address this concern, there is a need to create concrete measures on how to these risk information and contingency plans to the total enumeration of the school community. All members must be well-informed about the specific hazards risks in the school in order to heighten awareness and preparedness.

Keywords: *SDRRM, hazard, disaster*

Context and Rationale

Disaster risk reduction is crucial in the Philippines given the country's vulnerability to multiple natural disasters. Geographically located along the Pacific Ring of Fire, Filipinos recurrently experience earthquakes and typhoons which cause extreme flooding, landslides, and damage to infrastructure and life. The adverse effects have driven various sectors in society to strengthen policies and programs to reduce disaster risk. The National Disaster Risk Reduction and Management Plan (NDRRMP) for 2011-2028, aims to reinforce the communities to mend and recover from the negative impacts of disasters. Guided by the policy frameworks specified in the Climate Change Act of 2009 (Republic Act No. 9729), the Philippine Disaster Risk Reduction and Management Act (Republic Act No. 10121) and other policies, the country is building initiatives towards disaster risk reduction.

The United Nations defines Disaster Risk Reduction as the "concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events" (UNESCO and UNICEF, 2014). Disaster Risk Reduction Management (DRRM), on the other hand, is the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

As presented in various local and international policy agendas, it has been stressed that the education sector is one of the most susceptible during disasters. Schools, particularly the young students, often suffer the worse impacts from both natural and man-made hazards. The Department of Education (DepEd) recognizes that disasters deprive children of their right to a continuous quality basic education in a safe environment. They threaten the lives of children, their families, and education personnel. Disasters also set back the investments made by the education sector (School Disaster Risk Reduction and Management Manual, 2015). Reducing disaster risks confronting the education sector is paramount to the achievement of the DepEd's outcomes: access, quality, and governance.

Accordingly, DepEd has created the Comprehensive DRRM in Basic Education Framework, which underscores the three pillars: 1) Safe Learning Facilities; 2) School Disaster Management, and; 3) DRRM in Education. The core of the program involves the Department's aim to: 1) Protect learners and education workers from death, injury, and harm in schools; 2) Plan for educational continuity in the face of expected hazards and threats; 3) Safeguard education sector investments; and 4) Strengthen risk reduction and resilience through education. These specific interventions to address the effects of hazards are determined at the school level. The School Planning Team (SPT) and the School DRRM Team (SDRRM Team) are mandated to work together to implement the DRRM processes of assessment, planning, implementation, monitoring, evaluation and reporting. However, it is necessary that the entire school community—students, teachers, non-teaching personnel, and administrators—are involved in these processes. Students, particularly, are the core of each process. They must participate from the assessment stage (hazard mapping), planning stage (creation of work plan), and implementation of the capacity-building programs of the SDRRM Team so as to educate them on disaster awareness and preparedness.

General Emilio Aguinaldo National High School (GEANHS) is one of the secondary schools in the Division of Imus City with the biggest population. In School Year 2018-2019, GEANHS had a total enrolment of 9,788 Grade 7 to 10 students, including Special Education learners; and houses 416 teaching and non-teaching personnel, including the school head.

Considering the importance of the safety of learners and school personnel and the need for intensive planning and implementation of SDRRM in schools, this study

attempts to identify the school's potential hazards and the disaster awareness, preparedness and involvement in capacity-building initiatives of the school community, to create a local comprehensive disaster risk reduction management plan which will strengthen the school disaster readiness and resilience.

Research Questions

The study aims to identify the hazard profile of the school and the level of disaster awareness and preparedness of the school community. In addition, the research intends to focus on the existing capacity-building initiatives of the SDRRM and how involved the school community is to these programs, with the intent to create a comprehensive disaster risk reduction management plan. Specifically, the study answered the following questions:

1. What is the school's hazard risk profile, in terms of:
    a. Natural origin?
    b. Human-induced origin?
2. What is the level of disaster awareness of the school community?
3. What is the level of disaster preparedness of the school community?
4. What is the level of awareness on school disaster preparedness initiatives of the school community?
5. What plan may be developed to strengthen awareness and preparedness of the school community?

Methods

A. Participants and/or other Sources of Data and Information

The study utilized cluster sampling to identify student respondents, due to the huge population of the school (enrolment of 9,788). Three sections were randomly selected in each year level, a total of 12 sections as research respondents. Teaching and non-teaching personnel were chosen using systematic random sampling. The total enumeration of administrators (1 School Head and 8 Department Heads) were included in the study.

Respondents	Number of Respondents
Students	600
Teachers	80
Non-teaching personnel	10
Administrators	9

B. Data Gathering Methods

The primary sources of data of this study were results of the hazard mapping, researcher-made survey questionnaire, and written documents produced by and/or related to the school's Disaster Risk Reduction Management initiatives.

Prior to the conduct of data gathering procedures, the researchers secured permission from the principal through a letter which stated the purpose of the study and full disclosure that classes nor school activities will not be disrupted by any means. The letter also included the nature and manner data gathering, instruments to be used, and ethical considerations. All researcher-made questionnaires were also be validated by the school head. In order to attain the objectives of the study, the following instruments were be utilized:

1. *DepEd Hazard Mapping Checklist.* The checklist was adapted from the School Disaster Risk Reduction and Management Manual Booklet 1 from the Department of Education. The checklist was used to determine the potential hazards and risks that may affect the school community.
2. *Researcher-made Survey Questionnaire*. This instrument identified the school community's level of disaster awareness, level of disaster preparedness, and

level of awareness on existing SDRRM initiatives. The survey employed a 5-point Likert Scale, as seen on Table 2.

Table 2: Likert Scale for Survey Questionnaire

Scale	Interval	Verbal Interpretation
5	4.21-5.00	Highly Agree
4	3.41-4.20	Agree
3	2.61-3.40	Neither Agree nor Disagree
2	1.81-2.60	Disagree
1	1.00-1.80	Highly Disagree

Findings

Research Question 1. What is the school's hazard risk profile?

General Emilio Aguinaldo National High School has a total 20 Buildings with its perimeter: 4 Maliksi type Bldgs., 3 Remulla type Bldgs., 2 PL Bldgs., 2 DepEd Bldgs., 3 PPP Bldgs., New Bldg., Main Bldg., Admin. Bldg., Aus Aid Bldg.,Pagcor Bldg., BEFF Bldg. Students and personnel occupying these buildings are susceptible to both natural and human-induced hazards that may occur, especially during class hours.

A. Natural Hazards

As seen on Table 3, the hazards that may occur in school are typhoon, which causes flood, and earthquake. Palico IV, the location of the school, has low to high susceptibility to flood; high susceptibility to earthquake; and moderate susceptibility to liquefaction.

Table 3: Natural Hazard Risks Assessment

Hazard	Background	Possible Effects
Typhoon	An average of 20 typhoons pass through the country annually, between June and December. In 2018, Tropical Depression Inday placed Imus City in a State of Calamity, aside from other past typhoons: Typhoon Maring on August 19, 2013; Tropical Storm Gener enhanced by Southwest Monsoon on July 12, 2012; Typhoon "Isang" on July 15-19, 2009 (65 knots); Typhoon Inday on July 2002; and Typhoon Gloria on July 2002 (DENR-EMB CALABARZON Region. Action Plan for Imus-Ylang Ylang-Rio Grande Rivers Water Quality Area (IYRR-WQMA), 2015).	Strong winds and water infiltration in buildings that may cause deterioration and damage of property and infrastructure Flood (discussed below)
Flood	Typhoons, which cause heavy rains contribute to flooding that often occurs in Imus City. Moreover, the city is heavily prone to flooding caused by Imus River, where point of origin is north of Tagaytay City passing Silang, City of Dasmariñas, Imus down to Salinas and Mabolo, Bacoor. Location of the river is near Barangay Palico IV-A, where GEANHS is located. In this area, floods are caused	Unpassable roads Water infiltration in buildings that may cause deterioration and damage of property and infrastructure Damage of school records Contamination of drinking water

	by river overflow and inundation due to storm rainfalls from typhoons.	
Earthquake	PHIVOLCS found that an active fault extends in a north/south direction on the east side of Metropolitan Manila. If this fault moves, significant damage to Metropolitan Manila, including Imus City, is projected. In fact, Palico IV is under Moderate Liquefaction Hazard, once the fault activates. The hazards in the pilot area with a probability of occurring once in 200 years are as follows: seismic intensity of 8 to 9 on the MMI Scale (lower to upper 8 in PEIS); liquefaction probability is high along Manila Bay.	Old buildings to suffer moderate damage Electric substations will cease operations Fixed-line phones and mobile phone lines become congested because of the limitation of channels due to the shortage of electric power Wells and water tanks cease operations Threat to life

B. Human-induced Hazards

Table 4 shows that the school is at risk of: fire, due to special laboratories that uses direct heat and fire, and old electric wires and sockets; and terror attacks due to close proximity to the Imus City Jail.

Table 4: Human-induced Hazards Risks Assessment

Hazard	Background	Possible Effects
Fire	In most cases, flawed electrical wiring, failure of electrical appliances, overuse of extension cords, and overloading of electrical sockets, cause the fires. All twenty buildings of the school are occupied by over 70 classes who operate at the same time, using electrical gadgets and extension cords for classroom instruction. The school has recently upgraded its transformer to a three-phase set-up, preventing fluctuation; however, the pre-installed wires within the vicinity have not been upgraded. Furthermore, the older buildings, including the New Building and Maliksi 4, currently experiences inconsistent, and sometimes defective, electrical supply which may escalate into a fire. The New Building is also occupied by three Cookery Laboratories, where students use gas stoves, which if handled improperly may lead to a fire.	Buildings to suffer moderate to extensive damage Damage property Threat to life
Terrorist Attack	A terrorist attack may involve and/or escalate into hostage taking, bomb threat, and armed encounter. Terrorists randomly choose a place and time of operation, making it one of the greatest risks that the community may face. In case of terrorist attack, all individuals in the vicinity may be under a lockdown. One of the most plausible source of terrorist attackers is the Imus City Jail (BJMP), which is located within the same compound as the	Damage to property Threat to life

	school (LTO Compound), a 5 to 10-minute walk. Primarily, its clients are detainees accused before a court who are temporarily confined in such jails while undergoing investigation, waiting final judgment and those who are serving sentence promulgated by the court 3 years and below. The unforeseen breakout of these individuals with past criminal activities are threats to the school community.

Research Question 2. What is the level of disaster awareness of the school community?

Table 3 shows the school community's level of awareness on hazards and disasters. Students, teachers, non-teaching personnel and administrators "Agree" that they are aware of both natural disasters and man-made disasters that may occur in school. In addition, they "Strongly Agree" that they are aware of damages that disasters can cause, and that disasters may occur any time in any place in the school. Therefore, the findings of the study reveal that the members of the school community have utmost awareness on disasters including its nature, plausible damages, and inevitability.

Table 3: Respondents' School Disaster Awareness

School Disaster Awareness	Mean	Interpretation
I am aware of natural disasters that may occur in my school.	4.18	Agree
I am aware of man-made disasters that may occur in my school.	3.55	Agree
I am aware of the damages that disasters can cause.	4.35	Strongly Agree
I am aware that hazards may occur any time.	4.89	Strongly Agree
I am aware that hazards may occur in any place in my school.	4.63	Strongly Agree
GRAND MEAN	**4.32**	**STRONGLY AGREE**

With a grand mean of 4.32, it is conclusive that students and other key players in GEANHS perceive themselves are aware of disasters that may occur in the school anytime. This is significant, since awareness is the foundation of various means intended to diminish susceptibilities to hazards and risks. The objective of disaster education to inform people of plausible disasters and build awareness on its unavoidability. Disaster education attempts to intensify protective actions by people by presenting information about the hazard and the risk it poses (Kekic & Milenkovic, 2019). If planned successfully and well instigated, it will allow members of the community be accustomed to safety practices in all forms of their actions.

Research Question 3. What is the level of disaster preparedness of the school community?

Members of the school community have varied responses regarding disaster preparedness. Respondents "Agree" that they have identified the potential hazards/disasters in the school and that they are familiar with the emergency evacuation map. However, they responded "Neither Agree nor Disagree" regarding being familiar with the disaster plan of the school.

In terms of securing resources needed during disasters, respondents "Strongly Agree" that they have first aid kits in their rooms. They also "Agree" on the presence of functional fire extinguishers and emergency exits in their buildings.

Respondents of the study also have positive responses on preparedness during earthquakes. They “Strongly Agree” that they know what to do during an earthquake and that they can perform the Drop-Cover-Hold procedure. Similarly, respondents “Agree” that they know what to do during a fire; but are unsure on how to use a fire extinguisher. Finally, respondents also “Agree” that they can perform first aid treatment for injuries caused by disasters.

Table 4: Respondents’ School Disaster Preparedness

School Disaster Preparedness	Mean	Interpretation
I have identified the potential hazards/disasters in our school.	3.95	Agree
I am familiar with the emergency evacuation map.	3.50	Agree
I am familiar with the disaster plan of the school.	3.23	Neither Agree nor Disagree
Our room has a first aid kit.	4.82	Strongly Agree
Our building floor has its own functional fire extinguisher.	3.42	Agree
Our building has an emergency exit.	3.59	Agree
I know what to do during an earthquake.	4.70	Strongly Agree
I can do the Drop-Cover-Hold procedure.	4.82	Strongly Agree
I know what to do during a fire.	3.45	Agree
I can use a fire extinguisher.	2.65	Neither Agree nor Disagree
I know how to do first aid treatment for injuries caused by disasters.	4.05	Agree
GRAND MEAN	**4.22**	**AGREE**

Research Question 4. What is the level of awareness on school disaster preparedness initiatives of the school community?

In terms of the level of awareness on school disaster preparedness initiatives that the SDRRM conducts and implements, respondents “Agree” that they are aware of the programs and projects of the School Disaster Risk Reduction Management Team. On another note, they “Neither Agree nor Disagree” on participating in these programs. Most importantly, they “Strongly Agree” that the programs and projects of the School Disaster Risk Reduction Management Team can help us be aware of and prepared for disasters.

Table 5: Respondents’ Awareness on School Disaster Capability Building

Disaster Capability Building Awareness	Mean	Interpretation
I am aware of the programs and projects of the School Disaster Risk Reduction Management Team.	3.55	Agree
I participate in the programs and projects of the School Disaster Risk Reduction Management Team.	3.33	Neither Agree nor Disagree
The programs and projects of the School Disaster Risk Reduction Management Team can help us be aware of and prepared for disasters.	4.35	Strongly Agree
GRAND MEAN	**3.74**	**AGREE**

In addition to the findings presented in Table 5 above, respondents were also asked what programs and projects of the School Disaster Risk Reduction Management Team they are familiar with and participate in. School administrators and personnel have been able to identify the various programs of the SDRRM Team namely: National Simultaneous Earthquake Drill (NSED), Fire Drill, Junior Medics Trainings, First Aid

trainings and seminars, regular meetings with student leaders, and student orientations on SDRRM. Therefore, respondents are aware of the programs on SDRRM.

However, participation in these activities is a different matter. In the secondary level, the general principle in DRRM in education is less theory and more practice; student involvement is a key to building social capacity as regards education (Komac et al., 2010). Education about hazards can be performed by teachers and invited professionals such as doctors, firemen, policemen, and rescuers. Nevertheless, children of this age must be able to identify, foresee, evaluate, and monitor various types of natural hazards, especially those related to their activities, and to actively participate in their local communities. One activity that enhances involvement of learners in DRRM is student-led hazard mapping in school which is participated by student leaders, clubs, organizations and classes. This way, students are able to identify and assess the risks within the school. Yet, student respondents were only able to identify NSED as the program that they participated in, despite all the awareness and preparedness programs implemented regularly.

Research Question 5. What plan may be developed to strengthen awareness and preparedness of the school community?

The findings gathered from the study were utilized to craft a comprehensive contingency plan that has specific sets of protocols for the flood, earthquake, fire and terror attack (see Appendix A). Each contingency plan includes: a set of objectives; roles and responsibilities of the school and its stakeholders; protocols for students, teachers, personnel/administrators during and after the occurrence of the hazard; and resources needed.

Conclusions

This research looked into the hazard risk profile of school, as well as the level of awareness, preparedness and involvement of the school community on disasters, and initiatives done by the SDRRM Team.

1. From the assessment of the hazard, the school is at risk of both natural and human-induced hazards. In terms of natural hazards, the location of the school has low to high susceptibility to flood and high susceptibility to earthquake, with low susceptibility to liquefaction. In terms of human-induced hazards, the school is at risk of fire and terror attacks.
2. The findings of the study reveal that the members of the school community have utmost awareness on disasters including its nature, plausible damages, and inevitability.
3. Members of the school community have varied responses regarding disaster preparedness. Respondents agree that they have identified the potential hazards/disasters in the school and that they are familiar with the emergency evacuation map. However, they are unfamiliar with the disaster plan of the school. Moreover, respondents are more confident with earthquake preparedness than with fire preparedness.
4. In terms of the level of awareness on school disaster preparedness initiatives that the SDRRM conducts and implements, respondents have strong belief that the programs and projects of the School Disaster Risk Reduction Management Team can help them be aware of and prepared for disasters. However, despite being aware of the programs and projects of the School Disaster Risk Reduction Management Team, they are unsure and undecided about participating in these programs.
5. A comprehensive School Disaster Risk Reduction Management Team Contingency Plan was crafted to address the foreseen natural and human-induced risks in the school, and to strengthen the awareness, preparedness

and participation of the school community in disaster capacity-building initiatives.

Recommendations

Based on the implications of the study to management of disaster risk reduction, the following recommendations are presented:

1. The results of the risk assessment suggests that there is a need to create contingency plans specific for each hazard. Since each hazard has its own nature, cause and estimated damage, it is necessary to plot a set of protocols for students, teachers, non-teaching personnel and administrators in case the hazard occurs. This is to ensure that each member of the community knows his/her roles and responsibilities during both natural and human-induced hazards.
2. As a community with high awareness on hazards, it is recommended to sustain disaster awareness programs to cultivate preparedness and participation.
3. Education about hazards can be performed by teachers of different subjects. On the contrary, one important obstacle regarding the education for SDRRM is the lack of trained teachers in this area. In a school with a population of over 9,000, there must be more teachers to be trained, who will in turn educate and train students on hazards, to increase preparedness in the community.
4. The study shows that there is a need to create concrete measures on how to communicate risk information and contingency plans to the total enumeration of the school community. All members must be well-informed about the specific hazards risks in the school in order to heighten participation.
5. The contingency plan for specific hazards must be introduced and discussed with each member of the community to build their confidence in disaster preparedness. Each member must feel involved so as to increase participation and commitment to SDRRM.

Action Plan

Action	Person/s Responsible	Timeline	Resources Needed
Crafting Contingency Plans	School Head Department Heads SDRRM Team	SY 2018-2019	- School Hazard Profile - SDRRM Toolkit
LAC session with school administrators and key players in SDRRM	School Head Department Heads SDRRM Team	SY 2019-2020	-Contingency Plan - SDRRM Toolkit
INSET speakership with all faculty members and non-teaching personnel	School Head Department Heads SDRRM Team	Summer, SY 2019-2020	-Contingency Plan - SDRRM Toolkit
Planning on student orientation on Contingency Plans	School Head Department Heads SDRRM Team	Summer, SY 2019-2020	-Contingency Plan - SDRRM Toolkit
Student orientations on school hazard profile and comprehensive contingency plan (with SSG, Junior Medics, class presidents)	SDRRM Team	June SY 2019-2020	-Contingency Plan - SDRRM Toolkit
Student orientations on school hazard profile and comprehensive contingency plan (with all students)	SDRRM Team	July-August SY 2019-2020	-Contingency Plan - SDRRM Toolkit
Implementation of capability-building initiatives (trainings, seminars, etc.)	SDRRM Team	SY 2019-2020	
Monitoring and evaluation	SDRRM Team	December SY 2019-2020	-Contingency Plan - SDRRM Toolkit

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